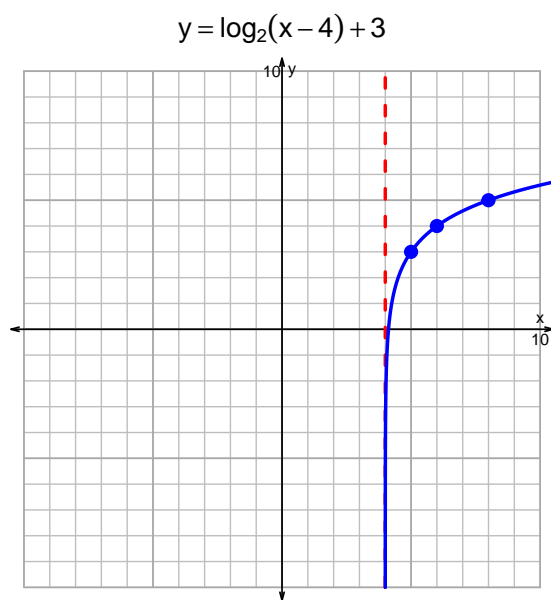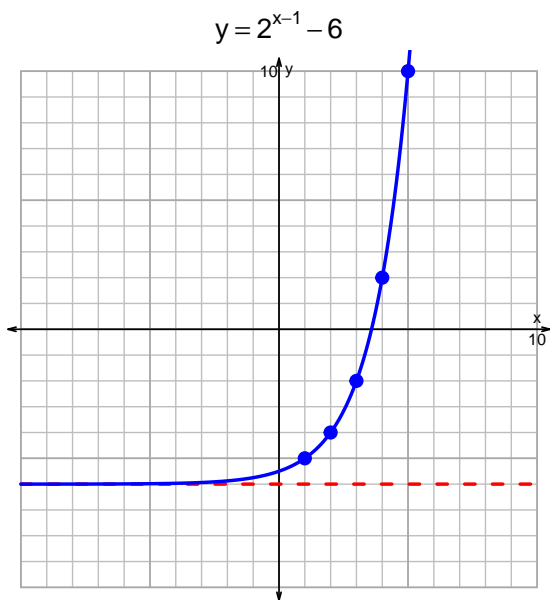## s18: EXP LOG (SLTN v352)

1. (10 pts) Graph $y = 2^{x-1} - 6$ and $y = \log_2(x - 4) + 3$ on the grids below. Also, draw any asymptotes with dashed lines.

$y = 2^{x-1} - 6$

$y = \log_2(x - 4) + 3$

Somewhat useful hint: $2^3 = 8$, and thus $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$-23 = \left(\frac{-7}{4}\right) \cdot 10^{-5t/3}$$

Divide both sides by $\frac{-7}{4}$.

$$\frac{23 \cdot 4}{7} = 10^{-5t/3}$$

Take log, base 10, of both sides.

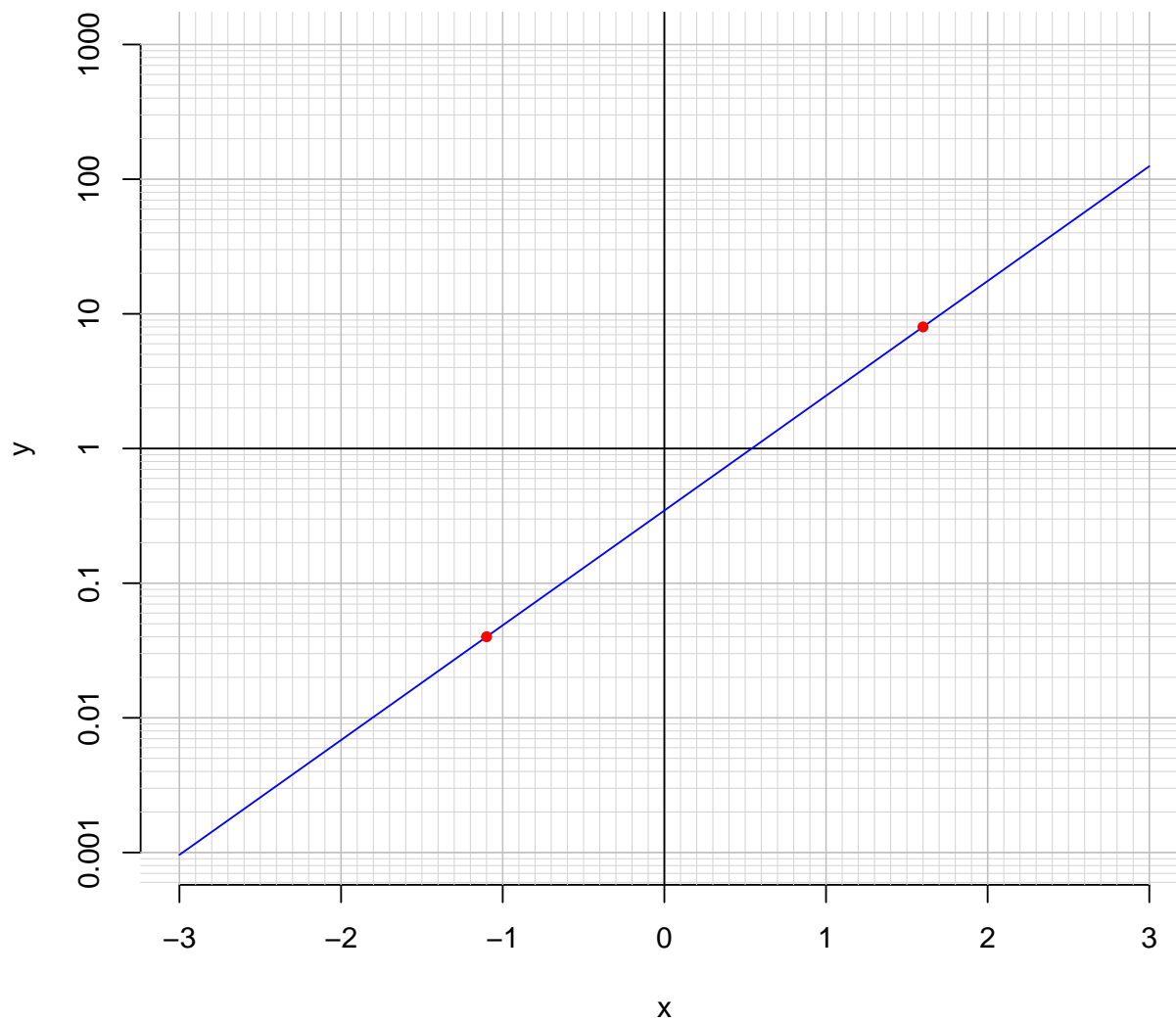$$\log_{10}\left(\frac{23 \cdot 4}{7}\right) = \frac{-5t}{3}$$

Divide both sides by $\frac{-5}{3}$.

$$\frac{-3}{5} \cdot \log_{10}\left(\frac{23 \cdot 4}{7}\right) = t$$

Switch sides.

$$t = \frac{-3}{5} \cdot \log_{10}\left(\frac{23 \cdot 4}{7}\right)$$

3. (10 pts) An exponential function $f(x) = 0.346 \cdot e^{1.96x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(-1.1)$.

$$f(-1.1) = 0.04$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{1}{1.96} \cdot \ln\left(\frac{x}{0.346}\right)$$

Using the plot above, evaluate $f^{-1}(8)$.

$$f^{-1}(8) = 1.6$$